REMARKS

As a preliminary matter, Applicants thank the Examiner for withdrawing 1) the rejection of claims 1-14, 17, and 19-21 under 35 U.S.C. §112, second paragraph; 2) the rejections of claims 1-5, 7-9, and 12-13 as anticipated under 35 U.S.C. §102(b) by Guschin *et al.* (*Analytical Biochemistry* 250: 203-211 (1997)); the rejection of claims 17, and 19-23 as anticipated under 35 U.S.C. §102(a) by Arenkov *et al.* (*Analytical Biochemistry* 278: 123-131 (2000)) and as being obvious over Wang *et al.* (U.S. Patent No. 5,922,617) in view of Drobyshev *et al.* (*Nucleic Acids Research* 27: 4100-4105 (1999)).

Prior to this communication, claims 1-16 were pending. Upon entry of the present amendment, claim 1 will be amended and claims 2, 3, 15 and 16 will be canceled without prejudice. The amendment of claim 1 is supported by the application as originally filed, does not add new matter, and is otherwise proper. Support for the amendment to claim 1 may be found throughout the specification including but not limited to claims 2 and 3 as originally filed and in paragraphs [0019], [0021], [0055], and [0060]. The amendments are presented in response to issues raised in the Final Office Action, and are respectfully submitted to place the application in condition for allowance or, in the alternative, to reduce the issues upon appeal. Moreover, Applicants submit that the amendments do not require a new search as only previously examined claim elements are included. Accordingly, entry of the amendment submitted herewith is respectfully requested.

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and the reasons that follow.

CLAIMS

I. Rejection of claims 1, 4, 5, and 7 under 35 U.S.C. § 102(e), based upon Taylor *et al.*, U.S. Patent No. 6,682,893.

In the Office Action, claims 1, 4, 5, and 7 were rejected under 35 U.S.C. § 102(e), as allegedly anticipated by Taylor *et al.* (U.S. Patent No. 6, 682,893). Claim 1 has been amended

to additionally recite the elements of claims 2 and 3. As acknowledged in the Office Action, Taylor does not teach the elements of claims 2 and 3, as originally filed. In view of the amendment to claim 1, from which claims 4, 5, and 7 depend, Applicants respectfully submit that claims 1, 4, 5, and 7, are patentable over Taylor and request withdrawal of the rejection.

II. Claim Rejections under 35 U.S.C. § 103(a)

A. Rejection of claims 1-14 under 35 U.S.C. § 103(a) based on Wang et al. (U.S. Patent No. 5,922,617) in view of Drobyshev et al. (Nucleic Acids Research, 27: 4100-4105 (1999)) and in further view of Arenkov et al. (Analytical Biochemistry 278: 123-131 (2000)).

In the Office Action, claims 1-14 were rejected under 35 U.S.C. § 103(a) in light of the three references cited by the Examiner. Applicants respectfully traverse the rejection of claims 1-14 as being allegedly unpatentable under 35 U.S.C. § 103(a) over Wang *et al.* (U.S. 5,922,617) in view of Drobyshev *et al.* (Nucleic Acids Research 27: 4100-4105 (1999)) and further in view of Arenkov *et al.* (Analytical Biochemistry, 278: 123-131(2000)). As stated in § 2143 of the M.P.E.P.,

> [t]o establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

Applicants respectfully submit that the Examiner has not established a *prima facie* case of obviousness. Applicants traverse the rejection first on the grounds that the combination of the above cited references does not teach each and every element of the amended claim 1, and second, that no reference contains a motivation to combine the cited references.

Amended claim 1 distinguishes over the cited art by reciting a series of steps, (a) – (c), for determining nucleic acid-protein interactions, in an iterative fashion as recited by step (d). Claim 1 further recites that "the nucleic acid, protein, or both used in repeated steps (a) through

(c) are different from the respective nucleic acid, protein, or both used in the first iteration." New step (d) incorporates the elements of claims 2 and 3 into currently amended claim 1.

Applicants respectfully submit that the cited references do not teach or suggest each of the elements of the invention as defined by amended claim 1. In the Office Action, the rejection of claims 2 and 3 is based in part on Wang *et al.*, col. 9, lines 24-25, and col. 17, lines 56-67. Col. 9, lines 24-25 states: "By repetitive iteration, one may then determine the specific entity." Applicants respectfully submit that the cited language in Wang has nothing to do with the claimed invention, but refers to a coding system for identifying "what is present at a particular site on the solid substrate." Wang, col. 9, lines 9-10. Specifically, the paragraph at col. 9, lines 3-25, of which the cited language is the last line, is directed to using headers to code for an address, placing those headers on the substrate, and methods of coding to create addresses. See, e.g., the underlined passages of the entire paragraph from Wang, col. 9, lines 3-25:

> In addition, by using headers one can code for an address. Thus, by using pits or bars having different sizes and/or different spacing, one can create coding which will define the track, segment or other feature associated with one or more bound components. By knowing what was introduced onto the solid substrate in conjunction with the header, one can read what is present at a particular site on the solid substrate. The headers can be placed in conjunction with the various structural elements of the solid substrate or pre-prepared arrays, so that one can readily determine what the bound component or the labile component is, which is in juxtaposition to the header. The coding can be introduced in any of the conventional ways, such as photolithography and etching, laser burning, chemical erosion, printing or stamping, etc. Alternatively, one may use dots or stripes of fluorescent dyes, the same or different dyes, so as to create an address where on can define the site by the order of emission wavelengths, intensity, size, or the like. **In some instances the coding may not be specific for a single entity, it being sufficient to know the identity of a relatively small group, usually under 500 entities, more usually under about 100 entities.** By repetitive iteration, one may then determine the specific entity.

In fact, taken in the context of the paragraph as a whole, it is not even clear what iterative process is being referenced by the final line. Based on the sentence preceding the Examiner's cited language (bolded above), the last line appears to refer to an iterative process for deconvoluting the coding to provide the identity for a bound component. In any case, neither the cited language nor the preceding paragraph to which it belongs teach that a different protein or

nucleic acid should be used in subsequent iterations of the method of determining protein-nucleic acid interactions.

The Examiner's further reliance on Wang *et al.*, col. 17, lines 56-57, as allegedly supporting the rejection of claims 1-14, and therefore, of claims 2 and 3, is also misplaced. At col. 17, lines 56-57 and further to line 60 Wang *et al.* discloses that "[t]he subject invention provides for a rapid method to detect interactions between two different components. The method and device allows for screening large numbers of different substances simultaneously or sequentially, providing for direct comparisons of the interactions between different substances." This language teaches nothing regarding the iterative process of the claimed invention. In particular, it completely lacks any teaching as to the use of different nucleic acids or proteins at subsequent iterations and fails to suggest why one might wish to do such a thing.

Finally, the Examiner has pointed to no teaching of Drobyshev or Arenkov that would cure the deficient teachings of Wang *et al.* Drobyshev and Arenkov are cited for teaching the use of gel pads alone. Office Action, p. 6 and 7. That teaching is insufficient to render the present invention obvious. As stated above, claim 1 of the present invention clearly sets forth an unambiguous method for characterizing a nucleic acid-protein interaction by enumerating specific steps that need to be taken, then repeating those steps with a nucleic acid, protein, or both that is different from the nucleic acid, protein, or both that was used in the initial sequence of steps. Neither Drobyshev nor Arenko teach or suggest these iterative steps for nucleic acid-protein interactions. Hence, Drobyshev and Arenko fail to teach or suggest the claimed invention.

Moreover, Applicants respectfully contend that there is no motivation to modify or combine Wang *et al.* with the other references to render the present invention obvious except through the impermissible use of hindsight based on Applicants' disclosure. Wang *et al.* never mentions or even hints that the solid support can be a gel pad. In fact, Wang *et al.* never even mentions the word "gel" in any other context within the disclosure, let alone disclosing that gel pads were contemplated by Wang *et al.* for use as a solid support. A general statement to the effect that "the solid support may take many forms" is simply too vague to provide motivation to

modify or combine Wang *et al.* with the other cited references. To the contrary, Wang *et* provides other disclosure that teaches away from combining it with the other cited references.

Applicants respectfully submit that the address and coding system disclosed by Wang is completely inoperable with gel pads and therefore teaches away from the combination of Wang et al. with gel pads. As understood by those skilled in the art, gels simply lack the ability to display the "pits or bars having different sizes and/or different spacing" required for the coding system of Wang. The inoperability of gel pads with an important feature of the invention disclosed by Wang *et al.* would lead the skilled artisan away from combining Drobyshev or Arenkov with Wang *et al.*

In summary, none of the cited references teaches or suggests the iterative process using different proteins or nucleic acids from the first run as required by the claimed invention. Second, Wang *et al.* is absolutely silent on the use of gel pads as supports and lacks sufficient motivation to combine the teachings with those of Drobyshev or Arenkov. Finally, the inoperability of the coding system set forth in Wang et al. with gel pads teaches away from the combination of Wang and the other references. Accordingly, Applicants submit that a *prima facie* case of obviousness has not been established. Applicants respectfully request that the Examiner withdraw the rejection of claims 1-14 under 35 USC § 103(a).

B. *Rejection of claim 15 and claim 16 under 35 U.S.C. § 103(a) as obvious over Guschin et al. (Analytical Biochemistry, 250: 203-21 (1997)) in view of Ahern (The Scientist, 20: 1-5 (1995)).*

In the Office Action the Examiner has maintained the rejection of claims 15 and 16 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Guschin *et al.* in view of Ahern. In view of the cancellation of claims 15 and 16, Applicants respectfully request that this rejection be removed.

CONCLUSION

For the foregoing reasons, Applicants respectfully assert that the application is now in a condition for allowance. Consequently, Applicants respectfully request the Examiner withdraw all of the remaining rejections, enter the proposed amendments, and allow the application to issue. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

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